

AVIATION WEEK

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FEB. 14, 1949

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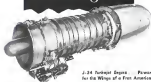
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AVIATION
WEEK

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NEWS SIDELIGHTS

Noticed Unity

Non-scheduled airlines, for the first time in their hectic history, have adopted a measure of unity in fighting against federal restrictions.

Publicly prepared by the recently organized National Independent Air Carriers has been published up by the daily press, and commentators have taken up the slogan for what they consider to be "little fellows" to trouble. Comments on CAB's proposed revision of the unscheduled exemption have been a ratio of six to one against the move. Besides publicly from more than 10 weeks, the Board has received no favorable comment from about ten maintenance companies and airport operators (bureaus of leasing, business, from several ticket agencies and from public officials) in Alaska, Detroit and New York. Eight scheduled carriers, on the other hand, start that CAB's new proposal doesn't go far enough, that the unscheduled exemption is illogical and that all regular operations with transport-type equipment should be banned.

Atomic Angle

The move to discuss the nuclear atom bonds the U. S. government to members of Congress or the public — to reject a new and important factor into the controversy over the use of Air Force that should be mentioned.

Both Chairman David Lilienthal of the Atomic Energy Commission and Sen. Strom Thurmond (D., Ga.) of the Joint Congressional Atomic Energy Committee have suggested discussion.

McMahon pointed out that Congress must pass intelligent judgment on the President's \$15 billion defense program for the coming year without overlooking the atomic bomb stockpile. "It's like a general who must train his troops without knowing how many rounds of ammunition they will be issued."

Feeder Finance

Reconstruction Finance Corp.'s is said to lend \$600,000 to Pacific Aircraft Sales and Service, Inc., to finance activation of Pacific Air Lines' and another feeder routes but shows the spotlight on other moves to aid still dormant short-line carriers.

Executive Atlantic Airlines President S. J. Bowman is exploring methods of obtaining money to get his own several feeder lines individually have been

Sales Threat

Officials of major transportation associations believe that the threat of a sales threat should be taken as CAB's threatened crackdown was not just a publicity stunt. Should the board's proposals its comprehensive review of regulations, the matter may be appealed to the courts by more irregular operators, but others probably will hold up almost immediately.

Representatives claim that of the more than 100 proposals being letters of registration from CAB as large irregular operators, more than 60 are active. It is estimated that these 60 non-scheduled airlines over 100 transport-type aircraft, employ 3000 persons, have carried around 200,000 passengers in the past year and have gross revenues aggregating \$15 million annually.

unable to take advantage of their franchise.

Parks announced last fall that if RAC refused to grant a lease, the company might try to sue the federal government through the sale of \$2 million worth of real property, including airports.

Transport Report

The Air Coordinating Committee plans to send to the National Security Resources Board a statement of general policy as a preliminary to the formulation of detailed plans for submission of the air transport industry.

This policy statement, which reflects the views of civil agencies, the military services and the airlines, will cover the allocation of commercial transport aircraft, prime and incentive to the armed forces and essential civilian services in the event of war. A system of priorities to be used in connection with transportation of passengers, mail and cargo will be discussed together with measures, including proposed government action, necessary for the most efficient operation of a wartime effort.

New Labor Move

Representatives of the unscheduled airlines met in Washington last week

with Dono Holmsted, head of the Air Line Pilots Assn (ALPA), to ask Bolender's ALPA to improve AFL representation of all its employees.

Notwithstanding that if they are ALPA organized they will acquire the powerful political backing both on Capitol Hill and in the executive branch of the government that they need as their last ditch fight for survival against the casualties of the new policies of the Civil Aeronautics Board.

CAA Files Examined

Pilot organizations who examined official correspondence relating to the purchase of four radio masts by the British from Aeronautical Radio, Inc., reported they saw no indication of irregularity in selection of CAA Administrator Del Bartolo in connection with the transaction.

Bartolo had made the files available after characterizing as "misleading" reference made to the transaction in the January newsletter of the United Pilots and Mechanics Assn. The UPMA reference while accurate in its wording, was incomplete.

Licensing Parley

Preliminary negotiations on reciprocal licensing of aircraft usable in both civil and military roles are the subject of meetings between top-level CAA and Air National Command personnel, with particular reference to the Boeing C-17A.

Boeing has applied for licensing of the aircraft for commercial use, principally all overworld routes. Differences in requirements are being worked out on the technical level between the two agencies CAA technical office, Boeing engineers and representatives of the U. S. Air Force.

PAA Grown Enough?

Former CAA Chairman James M. Lindsay, who is sparking the effort by American Overseas Airlines employees to keep their company alive, now eye to eye with Howard Hughes and Ralph S. Evans in their bitter opposition to the American's revitalized carrier, is now alive.

If he appears before CAB in opposition to the PAA-AGA deal, Lindsay will raise the question of whether Pan American Airways has not already given beyond the desirable strategic seat for an airline.



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AVIATION CALENDAR

- Feb. 10-11—National Representative Show, United General Public Show, Los Angeles
- Feb. 12—AIAA—Aeronautical Engineers, Washington
- Feb. 13-14—AIAA—Aeronautical Engineers, Washington
- Feb. 15-16—AIAA—Aeronautical Engineers, Washington
- Feb. 17-18—AIAA—Aeronautical Engineers, Washington
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- Oct. 25-26—AIAA—Aeronautical Engineers, Washington
- Oct. 27-28—AIAA—Aeronautical Engineers, Washington
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- Dec. 31—AIAA—Aeronautical Engineers, Washington

FIGURE CREDITS

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Inaccessible?

specify HI-SHEAR RIVETS

ACCESSIBILITY

Higher loads and tighter space limits... rivets for engineers and shop men.

HI-SHEAR rivets simplify design problems... they are more compact... require less tool clearance... offer maximum penetration...

- Installation speed—no blowdown
- No tool
- Rivet design makes angle for fit
- Long and lighter shank
- No shear stress parts and no shoring—No shear stress in a rough or rigid metal
- No stress in the work together
- No stress after work, positive joint separation
- No stress after a broad range of angles and sizes
- No stress after smaller and lighter joining equipment lower tool wear fatigue



NEWS DIGEST

DOMESTIC

Republic Aviation Corp. last week announced that two new models of the T-18 Thunderbolt now are in production. Deliveries have been made to the Air Force of the T-18A, while the first T-18B is expected to be completed in the spring.

One of South American's top experienced Navy attack bombers (NA-1) crashed in Santa Monica just last week while on a test flight.

CIA now has no intention of going ahead with the elaborate Andover, Ohio, plant testing base previously considered, but is studying plans for a more modest pilot program at the present CIA center at Oklahoma City.

Navy engineers have developed a solid fuel rocket to enable aircraft missiles to attain efficient operating speeds quickly. Already tested, it gives the missile a tremendous initial thrust.

Carson-Wright Corp. will move its general offices from Rockledge Center, New York City, to Wood Ridge, N. J., headquarters for its subsidiary, Wright Aircraft Corp. The step will be taken around Mar. 1, and will put company activities in one area.

FINANCIAL

General Motors Corp. reports net earnings of \$5,373,123 in the year ended Oct. 31, 1948, on sales of \$1,985,197,527. For the preceding year, the company had a loss of \$1,295,879 on sales of \$97,565,342. Company noted a dividend of 13 cents per common share payable Mar. 3 to holders of record Feb. 12.

De Havilland Aircraft of Canada in partial fulfillment of a \$1.25 for the fiscal year ended Sept. 10, 1948, reported a loss of \$658,194 for preceding year. Working capital for the Canadian firm rose from \$4,247,000.

FOREIGN

Representatives of 12 international airlines met in Brussels to establish preliminary machinery to discuss direct service across the North Atlantic. Further talks will be held for presentation to a May meeting in London or Paris of the 12 airlines, all members of International Air Transport Assn.

Aviation will fight its first home-built jet fighter in March. The first of 50 ordered by the Royal Australian Air Force, it is a modified version of the de Havilland Vampire. Engines is a Rolls-Royce Nene.

INDUSTRY OBSERVER

▶ Latest Pratt & Whitney Wasp Major T4T engine develops 4500 hp, easily one horsepower per cubic inch displacement. This rating is with water injection at full coolant power. T4T rating is 3800 hp, and normal rated power is 2800 hp. The variable discharge turbine principle was first tested on a Pratt & Whitney R-2800 in March, 1945 and was not tested on the R-4140 Wasp Major until 1946. The new engine is scheduled for installation in the Boeing B-54A bomber and the RB-54 photo reconnaissance plane.

▶ General officials are denying West Coast rumors that they are thinking of a new production version of the C-54 transport to sell for \$300,000 in competition with the Douglas Super DC-3 (Aviation Week, Jan. 31). Indications are that the proposal has been tossed around informally among company engineers with no firm plans for doing much about it.

▶ NACA researches metal fuselage will be available to provide methods for engineering fuselage studies in a program arranged by the committee on guided missiles of the Research and Development Board. Two new tests have previously been made on the fuselage structure but the new arrangement will make them available for tests of specific models prepared by manufacturers. Engines in fuselage will have separate metal fuselages as being expanded at contractors plant, after which time the NACA will return to its primary role of basic research.

▶ Allentown Manufacturing Co. of Los Angeles is making a new high speed aviation turbine designed to load 2000 and 10 other aircraft units at nearly twice the rate of World War II equipment. Engines are powered by small electric motors and each contains accumulators in a quarter section.

▶ Mooney Aircraft Inc. of Wichita is completing tests on a new model M-10C with a 65 hp. Lycoming engine replacing the Cessna engine. Production on the Cessna-powered Mooney helicopters has been stopped due to a series of motor problems and to permit investigation of increasing the power output through use of a small turbo.

▶ Aviation is making arrangements with foreign aircraft manufacturers to establish branch plants in this country for the manufacture of engine-based aircraft. Aviation plans to build up a center staff for operations in the Southwest Pacific.

▶ Vickers is planning a European tour for its Viscount turboprop-powered aircraft to demonstrate export sales. Tests will not begin until after the Viscount has received its official certification.

▶ Aviation maintenance reports indicate a number of recent minor difficulties in General Motors operations. Among them most frequently noted are: unreliable, expensive turbine engines in the exhaust system, cracks in cylinders and pistons, and failures in fans, bearings and shafts of the hydraulic system.

▶ Transwestern Air Lines, Oakland, Calif., has purchased controlling interest in the Oakland Airport, Eugene Service, a private airport near Oakland. TAM will require the firm's 14,000 sq. ft. of leased hangar space at Oakland Airport and will operate the Oakland activities as a separate corporation. Randolph Leach, formerly a partner in OAES, will be president.

▶ Advancing of English Aircraft Co., builders of the Trojan personnel plane at Newark, Calif., is being continued. Plant closed recently after producing 31 planes. Entire capital is expected to come from the airport. The plane is being quickly advanced, and is one of the most interesting personnel aircraft on the West Coast due to its extremely sophisticated structure offering relatively low cost production.

▶ Northrup Aircraft has issued its new XF-99 all-weather fighter the "Swamp", following up the line of lethal aircraft which began with the P-61 "Black Widow". Northrup has added a shallow dorsal fin over the upper rear fuselage behind the canopy to improve airflow over the area and improve its effectiveness.



Ground view of new Navion

Ryan to Sell Navion at \$10,965

Four-place for 1949 embodies new features, among them more power, streamlining and radio equipment.

Base tag of \$10,965 for the new 1949 four-place aircraft Ryan announced last week by F. Claude Ryan, president of Ryan Aeronautical Co., San Diego.

Powered with a 205 hp Continental engine, which gives an increase of 30 hp for takeoff over last year's Navion powerplant, the 1949 model has no retractable landing gear, newly streamlined with down and forward. The reduced drag and additional power raise the airplane's cruising speed to 155 mph. It is cruised with 300 ft/min, rate of climb. The 1949 Navion in performance tests has demonstrated itself in 360 ft and clearing a 50 ft obstacle in 375 ft with full gross load of 2750 lb, no wind at all level. It lands in 450 ft.

► **New Radio**—A new RCA receiver and six channel VHF transmitter and monomagnetic drag antenna, including a whip antenna on the fuselage. Bell antenna beneath the fuselage and six in fuselage antenna are standard equipment. Extended instruments are provided, in-

cluding rate of climb indicator, differential fuel gauge, outside air temperature, and manifold pressure gauge. Control levers are placed for easy identification to pilot's touch. Flap control is in shape of an aerial section, and is easily arranged to permit flap settings at any position between fully retracted and the full 45 degree downward position.

Monomagnetic leads in streamlined shape. Key-type ignition switch is also provided.

► **Lower Nose Landing**—New and thicker structural and thermal insulation is in fuselage side panels and ceiling of side-roof canopy, and a fuselage. Heavier gauge fuselage standard heavier nose and vibration, and new lower nose landing gear are also. Ryan dual master and master system controls go through a control panel beneath the fuselage.

Dual fuel pump system in last year's Navion has been improved by installing a new-type gear driven pump at the main carburetor, in place of the

New Yearbook

Exactly how many new military airplanes are being bought?

How much equipment?

Who's got the money?

Working with the largest procurement agencies representative in history, the Air Force and Navy in the past eight months have pumped money into the aviation industry.

What has this done to aircraft U. S. air power?

Aviation Week gives a comprehensive report on those questions in its Feb. 23 issue, the high annual yearbook and annual directory of U. S. Air Power. Specifications of the leading aircraft and engines of this country and of foreign nations—transport and personal as well as military—will be included. So will all available aviation statistics.

The directory of U. S. Air Power will, of course, go to all regular subscribers. Advance copies for extra copies are being accepted. Only a limited number of extra copies will be printed, and will be available at \$1.00 each on a "first-come, first-served" basis. Last year, extra copies were sold out within two weeks of publication.

rather drag-type previously used, and combining the electrically driven hydraulic fuel pump.

► **Other Improvements**—Dynamically balanced wheels and tires for all three wheels, improved landing gear mechanism, new type hydraulic pump, three-stage oil pump for engine operation, new exhaust air pump to use auto oil circulation system, wider back seat attached by screwing side arm rest, new seat design with thicker foam padding, higher back and head rest rest, are the standard equipment on Ryan's 1949 four-place craft.

Optional extra 20-gallon auxiliary fuel tank, is designed for installation under wing seat, keeping CG farther forward and clearing cargo space.

New Navion 1949 colors are named Italian cream, royal crimson, lacquer green and Raven black. They are designed to reflect color in conventional weathering condition.

Ryan has recently established the new distribution, giving the representative nationwide sales and service facilities for the first time, in preparation for an extensive sales campaign for the new model.

Jones Talks on Airline Financing

CAB member offers short and long term solutions, both with RFC aid, to help carriers over financial hump.

In advocating a broad program of federal loans to the airline, Harold A. Jones, Civil Aeronautics Board member, has set in motion considerable machinery on what major moves may be made for the industry.

Jones spoke recently at the American University Air Transport Institute in Washington. He made careful distinction that he was not speaking as a member of CAB but as plain "John Citizen," but many observers felt that the program he advanced may have been a real hunch.

The major recommendation encompassed both short and long term financing programs.

► **Short Term Program**—For short term loans, Jones would have the Finance Division Finance Corp. lend sufficient funds to financially embarrassed carriers to supply the needed working capital and to maintain liquidity to meet their commercial and debt obligations.

RFC, it is maintained, now has no authority to make such loans. The only authority is that they be approved by CAB and there be adequate assurance of payment of interest and repayment of the loan.

Also as a short-term measure, Jones would have RFC make temporary equipment loans to companies committed to purchase of new equipment, payment for which would be made by installment RFC. The necessary approval of such loans has CAB approval.

► **Long Term Plan**—The long term program advanced is the most sweeping in its objectives.

Jones proposed new legislation to permit RFC to guarantee equipment trust certificates for the airline, modified on a loan basis of the RFC Act providing federal guarantee of railroad equipment trust certificates.

He suggested that current commercial loans now secured by equipment would be refinanced and new RFC guaranteed equipment trust certificates sold to investors. These would have all the security of a Treasury note and might not require much more interest.

► **Voluntary Refinancing**—As part of the program, said necessary legislation could be enacted, all financially embarrassed carriers suddenly jeopardized by a hundred debt position would be permitted to enter a voluntary refinancing plan with the Board's approval. RFC would refinance the equipment loans on a far better financing basis, lower interest, sinking fund and repaid interest.

Such refinancing could be accomplished by direct loans or the purchase of equipment trust certificates by the RFC, methods believed possible now under provisions of the RFC act.

► **The Money Available**—Jones and the amount involved in this long range refinancing program would be about \$150 million of all airlines sought and paid off their capital structure. The point is made that these funds would not be given away; the RFC would merely be guaranteeing a loan or making one directly.

The financial condition of the airlines is currently regarded by Jones as "precarious." Further, in his opinion, the national interest, national defense and welfare of the people is a compelling reason for the assistance recommended.

► **RFC Report**—Some observers believe RFC recommendations must be viewed with the strictly completed in the airline business situation by RFC at the request of the President.

This report has widespread serious criticism in attempts to reflect rapidly changing conditions of some months. The first version was in the White House but had not been made public by midweek.

Jones may have had the RFC findings made available to him he would likely give public expression in opposition to any RFC recommendations.

► **On Competition**—Overstated in some quarters was Jones' highly significant reference to "extent of competition."

There may be too much competition over many routes," the CAB

member declared, "but the Board and industry are working on it, and the condition will be remedied." This may mean that along with the refinancing program, local measures of the airline may be attempted.

► **Reaction**—Reaction of the Jones recommendations varied according to the relative position of observers. Airlines hailed the need of financing recommended program. These critics which successfully have negotiated such difficulties viewed this new proposal as more government interference in industry and a premature act of situation which are unusual and need to be corrected.

Some with "line" airline credits are an opportunity to be looked out. Other banks were fearful that their good airline credit would be stepped by a federal agency.

Airlift: More Tons Than Wartime Hump

The Berlin airlift has now delivered more supplies to that blockaded city than were added across the Hump from India to China during the last war.

USAF, Navy and Royal Air Force planes delivered 877,951 tons over the 300 mi route from Western Germany to Berlin in the first ten months of the airlift. USAF planes delivered 756,374 tons over the 500 mile Hump route from India to China during that year of the last war.

► **Tomorrow Breakdown**—USAF and Navy planes have delivered 691,693 tons of fuel, food and other supplies to Berlin on 78,787 flights. RAF has delivered 223,204 tons on 96,674 flights. Total of 3,450,000 miles and 245,419 hours of flying time have been logged



Closeup photo show details of 1949 Navion interior.



NEW BRITISH FIGHTER

Although British weekly magazine 127 published the British press claiming the aircraft was the result of the Victoria Supermarine Attacker, also shown recently published in a Royal Navy advertisement is be-

lieved by informed sources to be an accurate picture of the new, single-engine fighter. The straight wing version of the Attacker is being produced in a Royal Navy series fighter.



Versatility Highlighted In Aquia II

New amphibian design, based on prototype Aquia I, is 6-place model for transport, cargo, rescue services.

A new twin-engine amphibian with "stream wings" capacity is being developed by a piston company in Wilmington, Del. It's the Aquia II, engineered by Aeroflight, Inc.

A high wing, single gear, 6-passenger model with wings for water stability, the craft is still in the blueprint stage, but an experimental prototype, the Aquia I, has already been successfully flight tested at Philadelphia's Bynum Base.

Only major difference between the two is power—Aquia II will have 185 hp Continental or 200 hp Lycoming engines while its prototype is equipped with 125 hp Lycoming.

Designed as an executive, general utility, or Army rescue plane, the new craft is reported to carry a useful load of 1400 lb. at 1600 mi. at a cruise speed of around 150 mph.

► **Market Demand**—Aquia II design follows the theory that there's a place on the market for a medium-sized, utility amphibian priced around \$125,000. It's aimed specifically at filling a gap between the expensive, high performance executive transport and the four-place bargain and personal plane.

Development of the new amphibian has been undertaken successfully and engineered, for the most part, by Nicholas C. Warden, Aeroflight's president,

who was associated with Cessna/Wright Corp. during the war and with Bellanca for a short time after the war.

Structural design of the new plane is based on inexpensive building. Economical construction is illustrated by the fact that the cost of building the prototype was only twice that of the anticipated sales price of a production model.

► **Wood Hull**—Noteworthy feature on the craft is the plastic-bonded birch plywood construction used from the fuselage down. Rest of hull is metal.

Warden says he used wood to "avoid the eye-balling potentialities of rivet construction" and to obtain a smooth bottom finish for quick, easy water takeoffs.

Hull entrance is 48 in. wide, and 30 in. long from the mainframe panel to the rear access door. An additional 6 ft. aft of the curtain is available for storing light articles.

► **Cabin Details**—Forward of the curtain are six seats spaced in pairs, with a center aisle. All seats can be moved for loading and unloading with cargo.

Control cables run along the cabin roof.

Seating and loading displacement is not a problem because a wide C.G. range is claimed for this model and little change in trim is required, flap up or down.

This advantage is attributed to the long tail and horizontal stabilizer placement.

A large windshield and four windows on each side of cabin give maximum visibility for the passenger and the pilot.

Doors, toward the rear on each side, are wide enough to permit loading and unloading of bulky items.

Windshield hinges at the top and can be fully opened to get access to struts on a plane at need for amphibious duty on rough water.

► **Seating Design**—Landing loads are carried across the hull by the heavy main spar of the winging. This structure was proven strong enough for impact on rough water when it was tested on prototype specimen along the entire section.

Lateral stability under converted landing conditions, however, was not satisfactory with the prototype winging, necessitating changes in the fuselage and airframe buoyancy.

These improvements were incorporated in the Aquia II, and the new winging has a special airframe—type giving assumed lateral stability in the water and allowing more effective planing.

► **Designed for Sea**—Seating houses the main gear which stores forward and

lower part of the wheel exposed at the loading edge of the airplane.

Gear is retracted and locked with an electro-hydraulic power package operating at 400 psi. This unit also operates the wing flaps.

Landing gear locking and retracting mechanisms are specially designed to protect it from ice accumulation.

Wing gear flaps enter a well in the bow of the hull. Both main and nose gear struts are made by Eberly, Inc., the main gear being a retracted version of those used on the Seabee. Brakes for the Aquia II are the Goodyear single-disc type.

According to Warden, a faster landing rate of previous amphibians in the Arctic has been their failure to retract the amphibious feature with due altitude, leaving the use of a waterborne emergency arrangement.

The clamshell plane can be loaded on water with air attached beneath both main and nose wheels without forward leaning part of the wheel exposed. This permits struts to sit against the winging contour, and the air to fill to add over the four wheels.

► **Life Vests**—The two-to-one taper of the hull centerline, metal wing, which has no tip floats, gives a very pleasing and clean wing configuration.

Practically no change from the prototype will be required in the Aquia II wing structure to meet the power increase of the new model. The two gear airlocks and longitudinal struts differed from construction was designed for the contingency.

The short wing—only 56 ft. span—with its semi-elliptical profile maintains an 18.5 sq. ft. lifting area at the wing contour to give the amphibian a sufficiently high lift capacity and low landing speeds.

► **Military Use**—As a general utility craft in the Arctic and high regions, Warden's design could be used to replace the dog sled and freight canoe as it transports the large number of supplies, weapons in the field packing and other essential supplies in that area.

He also believes it would be an economical military rescue plane. With a light load, it can "find its right place at low landing speeds (100 mph.) and take four personnel, damaged supplies, and effect a fully loaded takeoff wing into it necessary."

Present plans of the company are to continue flight tests to determine all phases of performance while giving sufficient insight to start talking and pilot production operations.

It's hoping for a military development contract as a means of attaining a well-balanced commercial and military production.

Others who have helped Warden in development of his amphibian are



Underline view shows winging by airlocks and provisions for housing landing gear.



Version of Aquia II design with dual for ARVN operation.

Aquia II Specifications

Dimensions	
Span	56 ft. 5 in.
Length	29 ft. 6 in.
Height	12 ft.
Hull width	6 ft. 4 in.
Wing	18 ft.
Wheel base	10 ft. 2 in.
Weights	
Gross weight	1800 lb.
Empty weight	1600 lb.
Useful load	1400 lb.
Estimated performance, craft fully loaded	
Cruising speed at sea level (50% water by)	115 mph.
Cruising speed at 7500 ft. (50% water by)	110 mph.
Rolling speed with flaps	94 mph.
Rate of climb with both engines at sea level	1000 fpm.
Rate of climb with single engine at sea level	350 fpm.
Absolute ceiling	16,260 ft.
Single engine ceiling	3000 ft.

Frank Mills, veteran airplane pilot and manager of the Philadelphia Seaplane Base, James K. Croyer, who made the working drawings for the prototype

and Earl L. Vincent, former U.S. Colonel in the Marines, who has been consulting for financial backing and creating an interest in the new plane.



New Copter Tests Pulsejet Power

American Helicopter's XA-5 built to evaluate engine's potential for affording increased short-haul payload.

A new helicopter—designed specifically for rotary-pulsejet power—is undergoing flight tests at Manhattan Beach, Calif.

It is the two-place XA-5 "Top Sergeant" produced by American Helicopter Co., Inc., and was built and flown in the short period of two months.

The machine focuses attention on structural simplicity attainable in job-powered designs, radial installation of rotating parts, high potential in lifting heavy payloads at short ranges and the development of a pulsejet engine showing unexpected durability under high wheel stress.

► **Design's Option**—The "Top Sergeant" has come in close to meeting design specifications that Congress D. Denno, AHC president, and designer of the craft, makes them characteristic.

"The pulsejet helicopter, in refined production configuration should double the payload now available in a reciprocating engine rotor of comparable gross weight."

"Design simplicity indicates lower production and maintenance costs than can be foreseen for any reciprocating engine aircraft."

"To quantify production a pulsejet helicopter of the size of the 'Top Sergeant' should sell for as little as \$500,000."

Denno focuses on pulsejet concepts along with the accompanying engine rotor for long-distance or long-endurance flight, but for short haul with high payload its potentialities are "enormous," he says.

Preliminary estimates for a series of military models, using the basic rotor and engine principle of the XA-5, show this pulsejet machine having a 150-hp motor and multiple engines could lift 70,000 lb. parked in a gross weight of 75,000 lb.

► **Performance Figure**—The XA-5, in its present form, shows a gross weight of 22,000 lb. and is designed to hover at an output of 60 hp thrust from each of its two AHC-designed engines, each having a maximum static thrust rating of 95 hp. Design maximum forward speed is 75 mph, cruising speed 55 mph.

Craft's useful load, in addition to pilot, is 550 lb. Conway engines feel this will be increased 150 lb., giving a total of 635 lb. useful load and raising the allowable gross to 23,000 lb., thereby efficiency gain expected to appear in a "second up" production version.

Performance estimates for the XA-5 offer an indication of the utility of the design, and can be projected for larger models.

Carrying pilot only, the production

version should show an endurance of 3.5 hr at 55 mph, cruise, 2.75 hr. at 75 mph, top speed, and ranges of 190 and 200 mi. for the two speeds.

With pilot and observer, endurance at the two speeds should be 2.5 and 2.0 hr., respectively, and ranges 135 and 140 mi.

As a rotor only, carrying pilot only and cruising with one passenger at mid-flight, endurance range is 175 mi.

► **Application Factors**—While AHC's immediate interest is in the projection of military uses, and, lifting heavy loads over otherwise impossible terrain—company engineers desire a wide range of commercial utility, ranging from air-lifted troops to service to personnel.

Johnsen, they conclude that the rotor of the pulsejet is a drawback in commercial planning, but anticipate considerable lowering of noise level through future engine advances. Although the noise level of the XA-5 engines is high at maximum power output it is easily tolerable at cruising power.

► **Engine Simplicity**—In those viewing the "Top Sergeant" for the first time the simplicity of the machine is striking and was emphasized by a dramatic "demo" staged by AHC officials.

Visitors disappointed in seeing the



Cherry Otto of pilot on XA-5 rotor shows engine stack fitting, torque support, fuel and ignition lines. Right: Details of both rotor mount and controls. Personnel are AHC's E. D. Kasper, research director, C. D. Denno, president, and A. C. Thomson, chief hand

XA-5 in disassembly on the shop floor—fueling, noise, and engine all separated—air, separated in seeing given a ready-to-fly assembly in less than 30 min.

On the flight strip a mechanic "discovered" that an engine is faulty and needs a complete overhaul—accomplished in less than 5 min. by replacing the worn valve gear, the engine's only moving part. One mechanic does it is what Denno tells his guests in "the world's fastest engine overhaul."

Flight follows the firing of one engine on starting the jet all as air hush into the intake, and starting of the second power unit by air as the rotor goes down from the front of the engine first level.

At present, development of the XA-5 is not concerned with light showmanship, but with the gathering of comprehensive flight data to prove performance estimates. Don Denno, AHC's director of research, reports that even in such estimates have been no such thing as a free lunch.

Technical interest in the XA-5 is attuned to the fact that it is claimed to be the first helicopter to have a rotor system designed especially to meet the low rpm speed requirement for successful use of jet-powered pulsejets.

► **Rotor Details**—The two blades of the XA-5, affording a disk diameter of 31 ft and a solidity of 0.66, are rotated at a tip speed of only 380-535 ft/sec, which is in marked contrast to the higher tip speeds achieved by rotor of reciprocating engine rotors.

Rotor blades are attached to a steel-

metal bearing body, and receive cyclic and collective pitch changes through a conventional control system. Drift of a chord is maintained, 20 in. for a blade length of 16 ft. Construction is laminated wood, plyform is one layering. Airfoil shape is derived from the NACA 0012 design, and spans from 2014 at the blade root to 1009 at the tip.

Steel plates on blade extremities provide moments for the pulsejet engine. Inlet from centrifugal drives opens the blade structure is closed by tying the engine mount directly to the rotor hub via a chain made after pressing through the blade center.

► **WMA, Technology-AHC**, engineers feel that one of the most notable aspects of the XA-5 project is the development of an engine capable of withstanding the stresses of high wheel speed while running at mid-range temperature.

At that writing the XA-5 engines had logged slightly more than 30 min of operating time with no indication of fatigue failures. While this is an extremely low period for engine endurance, company engineers claim it is a record for high-torque wheel rpm of pulsejets.

Two major pulsejet developments are involved in the design—the use of an advanced welding technique that eliminates welding seam fatigue cracks observed in initial engine drive shaft wheel nuts and a new method of attaching the turbine to prevent the valve rotor centrifugal bending forces.

Conventional machine welding of

inlets were found to be highly unsatisfactory from the standpoint of resistance to fatigue cracks. A switch to atomic hydrogen torch-welded seams appears to have eliminated the cracking "bug."

► **Maintenance Considerations**—It is too early to predict overhaul periods for the engine, but to date ground wheel and flight tests indicate that within these limits new hush developed there should be little risk of unexpected power failure.

The engine's conventional inlet and valve system is strengthened by using three-ply steel laminates.

Valve deterioration is induced by a gradual rather than immediately extensive loss of power, and is noted by increase of fuel flow requirement to maintain hovering or cruising flight.

Apparently the only engine maintenance required in periodic replacement of the valve block's 48 seats, contained in 16 valve packs, at a total exchange cost amounting to only 50 cents per engine.

Other maintenance on the XA-5 may prove to be relatively as simple as that for engine upkeep, for the rotor has only five engine hub bearings and two supporting the rotor shaft. Rotor hub is secured to the shaft by use of a single bolt.

This indicates low production cost for the rotor and gives support to Denno's estimation of a production unit price of \$3500. Additionally, ease of engineering and tooling by the one-templated military production mode will require the pricing of wheel axle

OUR FIRST

10 Years of



Hydraulic Progress

IN THE AVIATION INDUSTRY



TEN YEARS AGO the first hydraulic developments were started by Bendix in this modest building in Burbank, California. Then known as Bendix Aviation, Ltd., this organization has become one of the major sources of aircraft hydraulic equipment and has pioneered many outstanding developments. The present 130,000 square foot plant of Bendix-Pacific at North Hollywood, is shown on the opposite page.

- 1937 **JANUARY** BENDIX AVIATION LTD., a wholly owned subsidiary of Bendix Aviation Corporation was formed to sell and service equipment manufactured by various divisions of Bendix.
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- 1938 **JULY** FIRST PURCHASE ORDER was received for customer designed equipment.
- 1939 **JANUARY** FIRST EXPANSION provided room for enlarged engineering department.
-
- 1940 **JANUARY** FIRST HYDRAULIC PRODUCT designed and built at Bendix Aviation Ltd. was offered to the industry as pressure relief valve.
-
- JULY** LOCKER SPECIFIED 4000 PSI cylinders and valves for Constellation.
-
- DECEMBER** MANUFACTURING AREA at plant devoted to new additions.
-
- DECEMBER** FIRST BAKUL poppet type line valve designed by Bendix was introduced.
- 1941 **APRIL** ENGINEERING WORK LIMITED to new type pressure relief valve made new widely used by practically all major manufacturers.
-
- NOVEMBER** MOORE HOLLYWOOD PLANT with 130,000 square feet manufacturing area completed and occupied.
- 1942 **FEBRUARY** LARGEST PLAIN WHEELER used of Mississippi installed at Bendix-Pacific Plant permitting widespread use of fluid working in cylinders and landing gear drive.
- 1943 **SEPTEMBER** CONDENSER 8-10 inch landing gear cylinder designed and built by Bendix-Pacific, the largest aircraft cylinders now built.
- 1944 **JANUARY** BENDIX AVIATION LTD. became Pacific Division, Bendix Aviation Corporation.
- MARCH** MANUFACTURE of 3000 Bendix dropped AN regulators per month started.
- 1945 **JANUARY** PHARMATIC CYLINDERS and high pressure receivers designed by Bendix-Pacific were used in engine drives on B-29 Superfortress in help and work on Japan.
-
- MARCH** COMPLETE LINE OF 3000 PSI hydraulic equipment assembled.
-
- MAY** ALL P-80's modified to use Bendix General Gas flow valve in oleo brakes.
- JULY** PRODUCTION RATE for Bendix-Pacific General Gas oleos reached 1,000 per week.
- 1947 **FEBRUARY** 3000 PSI REGULATORS designed by Bendix were accepted by United Air Lines and Douglas to replace all old equipment on DC-4 and DC-6 airplanes.
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- DECEMBER** YEMAH 1000 BAKUL THROTTLES designed by Bendix accepted for Boeing B-50.
- 1948 **NOVEMBER** HYDRAULIC BOOSTER master cylinders for Lockheed specified.
-
-

Pacific Division
Bendix Aviation Corporation
 NORTH HOLLYWOOD, CALIF.



Bendix-Pacific pressure relief valve assembly built from acid in new B-29 installations.



Over 10,000 hydraulic pressure regulators built by Bendix-Pacific.



Bendix-Pacific is one of the largest producers of cylinders, landing gear cylinders, among manufacturers, more than 151,000 of all types.



As one of the major sources of engine drives, Bendix-Pacific has produced more than 75,000.



More than 20,000 hand hydraulic pumps have been sold since 1937.



The five hydraulic products shown above are typical of the 40-odd proprietary items made by Bendix-Pacific. Company engineers are available to discuss your hydraulic problems. Offices in New York and Chicago.

at several times that of its total law engine.

■Rough Weight-AirCo engineers estimate that a two-engine engine power system for a machine of the "Top Sergeant" gross weight would weigh approximately 100 lb, including engine and accessories, gear box, clutch, and an engine rotor assembly torque rate assembly.

In contrast, the total weight of the two pistons providing the "Sequester" is 60 lb, in which should be added 10 lb for accessories between the fuel tank and engine—two electrically driven fuel pump, throttle and master shaft valves, motorized shutoff (V), fuel flow, and a return and for transfer of fuel from a stationary line to a return line.

In general, the XA-5's control system follows a conventional pattern. A control linkage valve is used for direct-boost control, and is cable-connected to the engine (piston).

■Rough Product-Built to prove in the particularity of the pilot's motor system, the XA-5 makes no representation of the appearance and structure of the proposed production version.

The experimental machine is a quickly built product, and is considerably overweight in its fuselage structure. It retains the engine fuel, cockpit, and landing gear station of an Army A-6, incorporating engine repair, which are not designed for such applications.

While the "Top Sergeant" in American helicopter's most spectacular results, the relatively small experiment already has shown considerable progress in other aircraft and engineering activities.

It has been engaged in the design development of mechanically driven valves, the pistons, and the engine powerplants, demonstrating equipment for university use, human centrifuge for pilot training, and engineering work on experimental wing fuel location.

Bond chairman of AIRCO is Fred S. Baldwin, formerly chairman of Automotive Parts Co., Columbia, Ohio, and president of National Aerospace Parts Inc.

AIRC's president, Cowen Deary, formerly was project officer of Rotary Wing Branch, Wright Field, and chief helicopter engineer for Manassas Airfield Co., Vienna, Va.

Other managers of AIRCO are John A. White, secretary treasurer and company attorney, F. John Riddle, director of research, formerly project officer for U.S. Navy Bureau of Aeronautics in Washington, D.C., and former research director for Phoenix Helicopter Corp., and Allen C. Thompson, shop superintendent, formerly with U.S. Propeller Aircraft Co., Pasadena, Cal., and Minneapolis Aircraft Co.

Smoke Detectors Under Scrutiny

Airline studies show that reduction of sensitivity in devices will give fewer false alarms, still be reliable.

Months of experimentation with smoke detectors used in airline transport planes have brought noticeable improvement in reliability of these safety devices, but compensating modification of the units—taken out of the airlines because of suspected malfunctioning—may not take place for some time to come.

Early in 1948, after hundreds of false alarms by the smoke detectors, the Civil Aeronautics Administration permitted the carriers to document them.

■Part of Safety Program—Originally, CAAs ordered the devices removed in part of generally reduced fire protection requirements allowed late in 1946 after a series of mishaps involving fires in aircraft. CAAs had feared the problem of false alarms could be solved only by full test. The Air Line Pilots Assn., in urging the quickest possible elimination of the detectors.

About 70 smoke detectors have been in operation on the airlines in part of tests being conducted by the Air Transport Assn. in cooperation with CAAs, the National Bureau of Standards and the manufacturers of the devices. ATA plans to suspend the smoke detector situation shortly on the basis of reports submitted by airlines service testing the units. Thus, a determination will be made when the test program should be extended.

■Sensitivity Adjusted—Findings to date show that false alarms can be cut down and reliability maintained by reducing sensitivity of smoke detectors operated on either the photoelectric cell or an ionization principle. But CAAs will not order cancellation of the units until certain test advantages from the safety devices outweigh dangers caused by false alarms, and consequent forced landings and flight delays.

In the past, the photoelectric cell smoke detectors have been in stress when dust or foreign matter accumulated (they interrupted the beam). Equally robust in turbulent conditions and voltage fluctuations also can activate the device.

Photoelectric cell smoke detectors have been used by the airlines on modified by C-O-Two Fire Equipment Co., Newark, N. J., and Walby Kilde & Co., Belleville, N. J. Many flight Attendants Co., Pittsburgh, packages carbon smoke type and ionization detectors.

■Experimenting Vapors—Airlines tests show some variation in experience with the photoelectric cell devices. Capital Airlines reported a new type unit built for the C-O-Two company has operated in

a DC-3 for 536 hrs. with no reports of malfunctioning. A Delta Jet Lines unit on a DC-1 landed in its first test phase after 417 hrs., and two after false alarms shortly thereafter.

Indiana Air Lines accumulated 539 hrs. on a 141-C/O-Two company smoke detector without any adjustments, and a new type A-1 unit on a DC-1 has gone 558 hrs. without failure. Six other carriers also had trouble-free operation with the C-O-Two company device in DC-3s, DC-4s and Constellation during recent service test periods.

One airline reported that four of its six Kilde smoke detectors have operated up to 568 hrs. without false alarms. Two modifications had two false alarms each, but both tests revealed faults in the detectors. Twenty-four Kilde units being used by another airline have accumulated an average of 533 hrs., with three reported occasional failures and only one false alarm.

■Carbon Monoxide Detectors—A carrier that has been testing New Safety Appliances' carbon monoxide type detectors has had several false warnings, but most of them can be attributed to debris in the original installation which have been cleaned.

A carbon monoxide detector needs a warm up period of from 15 to 20 minutes before the engine is started.

If carbon monoxide has entered the belly compartments from an external source during landing operations, the detectors usually will not give an indication until after the aircraft has taken off. This means crew must take emergency action and return to the field. The manufacturer is working on methods of reducing the warning time to about 10 minutes.

■Balance Weight—It has been found that the carbon monoxide (CO) detector can be set off occasionally by discharging carbon dioxide (CO₂) into cabin being exhausted from the engine. The solution, decrease in temperature is believed to upset the balance of the sensitive unit, causing a false warning.

A carbon monoxide detector reportedly has been used in giving a reliable indication of smoke. With the low airflow in the cargo compartment, and high concentration of carbon monoxide which would result from a fire, several tests were made with the CO₂ concentration dropped to a point where there would be no warning indication. This time is considered the key to accept light sensor to work so that the fire has been extinguished.

NEW AVIATION PRODUCTS

High-Altitude Relay

Internationally tested, automatic, d.c. relay, type CCK1514, developed by Stephens-Dumas, Inc., 150 N. 7th St., Philadelphia 7, Pa., is made to meet extreme operating conditions of modern high-altitude craft. Special surface design insulates outside shell resistance up to 50 C., vibration resistance better than 10 G., high-speed opening and closing without contact bounce and reliable operation over an ambient range of 75 to 200 C. Sealing is intended to make unit insensitive to humidity changes and capable of used operation at altitudes as high as 70,000 ft. Relay has STCCT contacts normally rated at 1 amp, and capable of withstanding 10 cycles of 12 amps at 28 V. d.c. is rated at 35 V. d.c. with opening cycle of 1/100 sec. Device has cylindrical shape and mounting feet, and is approximately 1 1/2 in. high including screw base. Plug-in connector is 1 1/4 in. in diameter between hole centers is 1 1/2 in.



Explosion-Proof Heater

Solution to problem of heating low ambient locations safely is offered by Electrotherm Corp., 45 Chester St., Rochester 3, N. Y., through its electric explosion-proof heater. Heater is specially designed for use in atmospheres containing gasoline, oil, acetone, kerosene, solvent vapors and other flammable compounds to aviation base activities. Device incorporates cast aluminum, natural corrosion safety guard. Heating element is dual-chamber with resistor unit, insulated and electrically insulated, being contained in a one-piece fused aluminum casing. This unit cleaned, eliminating fire, shock and burn hazards. Cast aluminum at low operating temperatures, has high thermal conductivity, and is resistant to corrosion and deterioration. Features a win win mounting, and unit may be thermally controlled through overvoltage. Three models are available with ratings of 5000, 4000 and 6000-watt two-wire for temperatures up to 240, 430 and 650° single or three phase.

Portable Sheet-Cutter

Easily maneuverable cutter for sheet metal, "Niblette," is capable of cutting circular cuts with radii as small as 1 in. and making true type plate. Tool cuts material up to 30 gage (0.040) without bending, burning or distorting of metal. Also suitable for cutting plastic sheet, device weighs but 13 lbs., can be cradled in the jacket and be fixed in cut of my 4-in. motor in the same manner as drill. Tool consists of 7 simple parts which may be replaced at comparatively little cost. Device is marketed by Nord International Corp., 133 Greenwich St., N. Y. C.

Nylon-Fibre Plane Carpet

Two qualities most needed in airplane carpeting—light weight and high wear resistance—are offered by Aerosolite Corp. & Son Carpet Co., Yonkers, New York, in new Nylon-fibre carpet. This fabric meets flame, aging, moisture and mildew, and has color fastness low moisture resistance and dimensional stability. Easy cleaning is accomplished with soap and water in various commercial solvents. Laboratory tests are

reported to show shrinkage of less than 1 percent in length and width after shampooing. Drying is quick because Nylon-fibre carpet is water resistant even if laid as much water as wool. Re-washing will not appear as appearance and feel, material is available in solid, pattern, gray and burgundy, in 27, 36 and 54-in. widths. Weight is approximately 2 1/2 lb./sq. yd.

Simple A.D.F. Computer

Navigation and fire transport and cross-country plans is produced, also by A.D.F. Computer marketed by Filmon & Dool, 416 W. 177th St., Hawthorne, Calif. Quick finding of all times, supercomputer data is accurate with direction of travel under stand instructions show explicit finding of Q.D.M.I. location of quadrant position, intersections of predetermined heading, entrance of distance from station, finding, time from station, and distance to it. Device is reported to have been flight-tested by airline personnel.

Improved Hardness Tester

New Rockwell hardness tester, offering simplicity of servicing, is announced by Clark Instrument, Inc., 10310 Paul Road, Dearborn, Mich. Instrument features simple housing and instrument assembly that may be replaced by operator without requiring removal of tool or specimen. Other innovations include "Revolutions" specific that allows constant minor load, positive triping to overcome occurrence of misaligned support lead by friction on day of tipping lever on loading beam. Body is lightweight cast aluminum. Use is applicable for testing hard or soft metal, brass, aluminum, cast iron, copper, steels, and plastics.

WHAT'S DOING

at Pratt & Whitney Aircraft?

Frequently, people ask us, "What's doing at Pratt & Whitney Aircraft?" It is a thought-provoking question and perhaps you would be interested in some of the answers. Through messages like this we hope to share with you some of our aims, some of our problems, and some of our achievements.

As you know, Pratt & Whitney is in the business of producing horsepower and thrust. It is highly complex — this work of designing, developing, testing and producing aircraft power plants. Even long after an engine has reached the production stage, a corps of engineers is hard at work refining its design in the light of the latest knowledge and experience. Simultaneously, another group of engineers is concentrating on the engines that will be put on the production lines tomorrow.

As matters stand today, we are hard at work in three major fields. First, we are delivering the Turbo-Wasp®, the first turbo-jet engine to bear the famous Pratt & Whitney emblem. This project involves an entirely new set of problems and responsibilities, since completely new production techniques are being developed and proved. This engine is designed to power some of today's fastest fighter aircraft.

Second, we are producing and continually refining the Pratt & Whitney reciprocating engines which have become known the world over for their dependability. These engines will continue to power the long-range, load-carrying aircraft for a long time to come. A new member of this famous family — the Wasp Major-VDT — brings to it some of the advantages of turbines while retaining the advantages of the piston type.

Third, we are devoting hundreds of thousands of man-hours of engineering to the design and development of new turbine types to meet the needs of America's future airplanes, still shrouded in secrecy.

To keep all this going on smoothly, thousands of our employees are engaged in production. Other thousands are busy in our various test sections, wind tunnel experiments, flight test activities and field service branches — all contributing to the sum of activity at Pratt & Whitney, all helping to make our engines the finest that engineering skill can produce.

* Wasp® is a registered trademark of Pratt & Whitney Corporation.

WHAT IS VDT? WHAT ARE SOME OF ITS BENEFITS?

- ☐ A piston engine?
- ☐ A turbine?
- ☐ Combination of both?
- ☐ High octane fuel?



Several months ago we announced the development of a new type engine. This is a combination of a conventional piston engine and a turbine. It is called VDT — or Variable Displacement Turbine. A highly developed form of this engine is the R-2600 Wasp Major VDT. This power plant gives promise of adding considerably to the range of heavy bombers and strategic transports.

The first installation of the Wasp Major VDT is in the Boeing B-24. With its four engines, this bomber will have more than 16,000 horsepower to climb and will show substantially improved performance.

WHAT IS THE PRESENT STATUS OF THE TURBO-WASP?

- ☐ Design stage?
- ☐ Development?
- ☐ Testing?
- ☐ Production?



Is it some the answer is — all four. The Turbo-Wasp has passed its official Pratt & Whitney type test and engine test course of the production line. At the time test, engineers are hard at work on the same type power plant to make it more efficient, more powerful, more dependable. Already some of these engines have been ordered by Governments for their latest shipment of fighters, the F4U Corsair. The type on the production line right now is known as the Turbo-Wasp J44 F-4, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 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BRIEFING FOR DEALERS & DISTRIBUTORS

FACTORY-BUILT SPRAYERS—At least two lightplane manufacturers are going after the agricultural spraying and dusting market with factory-built 1949 models. Piper Aircraft last week introduced its distribution of two versions of the 90 hp. PA-11 tandem trainer equipped as a sprayer or duster, priced at \$3395. Rayway Light Aircraft is making

Art Winkelman, Piper distributor at Portland, Ore., who has been making dusting and spraying equipment for Cobs, will supply the spray tanks, spray equipment, wind generators, and dusting fans.

Competing with the Piper sprayer is an aircraft Lessorco 90 hp. Otherwise, priced at \$3395, Rayway Dakota, equipped with spray tanks manufactured by Independent Crop Dusters, Campbell, Calif. The Lessorco sprayer is fitted with one high-lift wing flap, a McCauley Main-Prop, Safe Flight fuel control indicators, check harness and even speed (7.0 to 6.00) tires. Two 36-gal self-igniting wing spray tanks and two wind-driven spray units are provided. Spray rate and cutoff is controlled in cockpit. Lessorco reports stalling speed is 40 mph in power on full flaps, and spraying speed range with full flaps is 50-80 mph. At recommended gross weight of 1900 lb the Lessorco sprayer will carry over 50 gal. of spray solution. Each sprayer is designed for removal of equipment except for spray tanks, for general utility uses in all seasons.

Paper has a small head start on Lessorco, as in CAA approval. Lessorco however claims: "A greater equality than any other 90 hp. sprayer." And claims that new design dust ducts act upon toward the ground when entering drift and creating a rebound effect similar to that from a helicopter sprayer, making possible "a better field of seeds or insects with less chemical than can be obtained by any other type of fixed wing spraying equipment."

Lessorco expects to "start quantity production immediately" following CAA approval expected in the very near future.

COLLISION—It does not look as if it will ever be definitely established just how the collision at the Coast 140 and the Coastline near Mitchell Field, L. I. happened. Most press accounts seem to take it for granted that the lightplane pilot was at fault, without any very good reason that we could use for such an assumption. Actually it is just as likely for a lightplane to sight a right-of-way with a biplane in place, as for a biplane to sight a lightplane with a biplane at a grade crossing, or for a biplane to sight a lightplane with a biplane at a grade crossing, or for a biplane to sight a lightplane with a biplane at a grade crossing.

But the very narrow escape of the plane's crew and passengers and the death of the two occupants of the light plane give point to two aviation needs: a radio warning device installed in large transport aircraft to indicate whereabouts of other aircraft which cannot be spotted visually, and additional emphasis on alertness by pilots of small planes who have enough visibility and maneuverability to avoid such collisions easily if they will use it.

MORE ON MIDGET MUSTANGS—Up at Lock Haven last week Dave Long, builder of the Midget Mustang (Aviation Week, Jan. 17) reported he had flown his 10th all-metal one-place biplane last week averaging 170.5 mph for the 1125 miles, on 41 gal. of fuel. The deal to sell the prototype plane reported in our earlier story, was completed, while Schneider is looking for the first five production planes.

Long has put a price of \$4995 on the production Midget Mustangs, with a \$1000 down payment for a few orders.

One biplane-builder aviation man who has flown a lot of cross-country crashes: "The plane's biggest market will be with business men who want to travel fast, light and alone. The extra people make you late starting and you have to make extra stops and off up your airplane with their baggage. With this ship you don't have to take anybody."

BETTS FIELD CLOSED—Betts Airport, first commercial flying field at Pittsburgh, has been closed permanently by its purchase for use as a stunt site by Weatherby Electric Corp., Wheeling, Pa. and \$125,000 for the field. It was the scene of the 1937 National Airlines Race, and J. B. (Slim) Cunningham, now president of Capital Airlines, once flew mail and passengers from this field. —ALEXANDER McSWEENEY

the back seat appeared somewhat crowded. Priced by the Clipper is \$600 in only 12 ft. less than the 15 ft. ply load for the Conquest. With 30 gal. of fuel the Clipper is credited with a range of 800 miles at cruising speed of 112 mph.

Business Utility—Actually like all but a very few of the so-called two-place on today's market, the Clipper will carry three persons with baggage and full fuel load, or four persons without baggage and less fuel load. But its greatest usefulness will be as a business and family two-place with lots of cargo and luggage space, with the added convenience of the built-in seats for passengers when it is needed. Best seat is quickly convertible, and rest door off is built with the cabin floor for easy cargo loading.

Dollar Value—The Clipper handles easily with four people. It lands at normal 50 mph, a little faster than most previous planes, but appears to have the same forgiving light plane characteristics that its predecessors have shown. All said, it appears to be the best dollar value for utility yet introduced in the personal plane field.

For a thousand dollars more, the new 1949 Finley Cruiser is still the second lowest priced two-place on the market. A light four-seat biplane at Lock Haven is a 1948 Cruiser, and it refers flight in Bero House's 1949 model, gives excellent opportunity for comparing model changes. Main noticeable is the seating arrangement in the 1949 model and the additional leg room. Instead of the "Rube Goldberg" folding front seat of the 1948 model which was usually abused by customers, there are now swiveling sliding seats which lock into place in three positions. The interior has been polished over the most luxurious looking plane Piper ever built.

Collier Headed—At the dinner meeting the William Piper, Sr., and J. J. paid tribute to Al Gifford of Billings, Mont., as the top Piper distributor of 1948.

"In previous years," and another of the Bill Piper Co., "we used to have the high ball distribution club for the leaders. But this year we decided first of all to do a big enough sales job to bring most sales up."

Sales Presentation—Piper announced that George Tramm, 1947 Super Cruiser model the world first, was available as a sales presentation speaker and would work under sponsorship of the company.

The return flight plane builder told Aviation Week he is counting on about the same number of sales for 1949 as in 1948 (approximately 1,500), but expects more business preparation. Piper actually is setting its sights higher for 1949.

AIR TRANSPORT



En route to the Alamosa Energy Commission, Los Alamos, N. Mex., scientific liaison trip, their passengers are shown following Cessna Air Service's chief pilot Bill Harbo.

En route to a North American flight school, the 60-mile trip northwest from Albuquerque, Cessna flies in business and two North D. H. models.

Lightplane Lines Seek Certificates

Two interstate carriers using single-engine aircraft ask CAA permission to transport interstate traffic.

High cost of conventional feeder operations conducted with transport type equipment in outfitting projects to run lightplanes over low traffic, these had been.

Two manufacturers carriers operating scheduled interstate flights primarily with small single-engine aircraft have asked the Civil Aeronautics Board for permission to carry interstate traffic on their present operations. Officials of both companies admit that experience gained since 1947 shows conclusively that their services are economically feasible and expect a public need for air transportation.

Swiss Airline Energy Commission—One of the applicants, Cessna Air Service, operates as single-engine, four-place Beech Bonanzas and two two-engine, seven-place Beech D18 aircraft over 60-mile route between its Albuquerque, N. Mex., base and the Alamosa Energy Commission's Los Alamos laboratory. Operation began in September, 1947 in a contract carrier for AEC, Cessna, during the 13 months ended Jan. 1, 1948, flew 5712 passengers and 131,073 lb of freight without an accident.

A second applicant, VolAir Lines, Inc., Mercedes, Tex., operates over single-engine, four-place Ryan Navajos from the Rio Grande valley to San Antonio and Houston. From April, 1947, to Jan. 1, 1948, VolAir carried 5475 passengers, 1,512,315 lb of freight and 15,000 lb of mail without an injury or fatality.

Equipment Poss. Problems—Some questions exist as to whether the services as now conducted violate the Civil Aeronautics Act as the Civil Air Regulations, thereby creating a federal, mail, down. VolAir admits finally that it now carries some interstate passengers on its interstate run, asserting that to police the operation against all such



PAN AMERICAN GETS STRATOCHIEF DELIVERY
Capt. Scott Frewer Smith, chief pilot—acquiring for Pan American, seven from the manufacturing inspection division for Boeing, the big back of the Stratochief

traffic virtually as an impossible task. Civil Air Regulations now specify that single-engine equipment can be used in scheduled, revenue, passenger carrier, daylight contact flights if the planes were type certificated prior to June 10, 1942, and are issued by the Civil Aeronautics Administration to be used for the operation proposed. Future type certificate after that date and used in scheduled transportation must meet the stringent requirements of the transport category—no obvious responsibility for single-engine equipment.

Rule Changes Considered—Modification of the rules covering single-engine aircraft is being considered by CAA. Perhaps, the Civil Aeronautics Administration has found discretionary power to authorize temporary feeder operations which do not comply strictly with the regulations.

Clark M. Carr, owner of Cessna Air Service, plans to use Bonanzas and D18s until more suitable planes become available. Meanwhile, he states, "In case of scheduled service, it is not economical, operational, safety or common sense participation for prohibiting the use of single-engine equipment while at the same time permitting its substitution on unscheduled flights which can not be as closely controlled from the standpoint of inspection, maintenance, communication or route pattern."

Significantly, even certified feeder routes (DC's act), for all practical purposes, often turned to daylight carrier operations. Many of these intermediate points lack airport lighting and have, of necessity, been bypassed on some



delivered in PAA, Vernon H. Graham, chief of the manufacturing inspection division for Boeing, the big back of the Stratochief

lights, especially during the winter months. **Lighting, Challenged**—Val Air also vigorously campaigns for use of single-engine equipment. S. H. Collier, president, points out that his Novara can provide service to airports not able to handle DC-9. Disruption of operations at the San Grande valley and the large number of relatively small cities does not permit limitation of service to one of two central points with good fields.

Val Air's passenger rates average 64 cents a mile, somewhat higher than most feeder lines.

The small group of businesses that represent Val Air decided at the outset that traffic would be light and would demand frequent service as well as the real steps in the valley. Consequently, they provided equipment with capacity closely related to the expected passenger volume rather than the emergency 12 or 24 passenger DC-9 which they felt they would operate with most of their own capacity.

Val Air says its experience proves it is economically feasible to operate small equipment geared to the traffic volume at a regularly scheduled service. "The public does not demand DC-9 operations between all points," Val Air asserts. "They accept and are satisfied with small plane services under such con-

ditions as are present on the Val Air system. The public responds not in proportion to the number of empty seats flown but in relation to need for the service and confidence in the operation."

Cost Data Provided—President Collier selected his company in providing cost data which can be used as a yardstick to test the assumptions of costs shown by several certificated feeder operations which have an average of two air time passengers per plane mile. "It is obvious," he told CAA, "that Novara could have handled the loads carried by Trans-Terray, Wisconsin Central Air Lines and Florida Airways."

He declared that Florida Airways, which has been operating since early 1947, has exceeded an average load of three passengers in only one month and then by only 97. Last September, CAA refused to extend Florida's temporary certificate beyond Nov. 28, 1949, because of the high mail pay subsidies which were necessary to support this operation.

CAA and that because of the light traffic, the government would have to pay Florida at least \$18 in cost subsidy per passenger carried.

New Plans Rejected—Collier asserted that earlier Novara air for the first or to replace equipment Val Air expects to be

available soon could handle the loads of several other feeders. Harry Brown, Val Air's Washington attorney, said the company is interested in several new aircraft, including the Boeinge Stearman, five-place, two-engine executive transport which the manufacturer is hoping to be able to use for less than \$15,000 (Aviation Week, Nov. 22).

Cisco agrees that suitable new light transport will be available within two years. The carrier issues its statement on current equipment with two-engine models which are now undergoing engineering tests.

Val Air's application for a certificate of transportation is not subject to the right of way. The company plans to install the passage of new air route legislation drawn up by the Post Office Department, which has indicated repeatedly that it is deeply concerned over the high cost of conventional feeder operations.

Air Route Expansion—Dashed by Second Air Route Experimentation Grant and Act, the proposed legislation would allow the use of 15 air miles out of 15 air miles, all of which would probably be operated with small planes. At present, the Post Office is hesitant to list feeder lines as state aircraft in any given year and these can only be let where transportation of mail by surface means is not feasible.

The new law would permit operation of an air route where they are "needed" to surface routes. The Post Office now has only two small domestic air routes, both extending from the mainland to islands in the Great Lakes. In Alaska, the Department already has authorized several small aerial contracts for services not covered by a CAA certificate.

Career Operations Unique—Val Air Air, Carr has asked CAA for authority to carry mail as well as passengers and cargo. Since November, 1947, Carr has been flying and into and out of Los Angeles at no cost to the Post Office.

Currently operating under a New Mexico State Department Certificate of Public Convenience, Carr's passenger fares average about 12 cents a mile. The eleven flights from Albuquerque into Los Angeles, with a stop at Santa Fe, take about 10 minutes, compared to a minimum of 24 by surface transportation.

In Los Angeles, Carr is not allowed to let any person leave his plane. His 1948-49 contract with the Post Office will not allow him to do so.

Carr now makes five roundtrips each week between Albuquerque and Los Angeles.

The contract of the Atlantic Energy Laboratory is looking Carr's bid for a certificate.

Northwest, PAA Feud Over Pacific Routes

More representatives have developed from CAA and White House more last year which indicated the increasing importance of two carriers over a Pacific Northwest. However, more that reportedly looked different traffic potential to support one operator.

Northwest Airlines has asked CAA to reassess the substance and content of its findings to the President. The Board certified NWA for the Seattle-Portland-Honolulu route last July. Early in October, President Truman directed CAA to grant a certificate to Pan American Airways as the carrier of national security and the public service.

In this step, one of the faces of a CAA decision's finding that the route could not support two air certificated carriers without high subsidies.

Real Motive Seen—Northwest asserts that PAA is now seeking the real reason for its letter, rather than to obtain a Pacific Northwest-Honolulu route. "It is obvious," Northwest declares, "that PAA is trying to secure a link across the North Pacific perching that awarded NWA and Pacific Air American in CAA's Pacific route decision in the summer of 1949."

Only last month PAA asked CAA to award its Pacific certificate to permit service between all Pan American terminals on the U. S. west coast (Los Angeles, San Francisco, Portland and Seattle) and Tokyo, Japan, and beyond without any requirement of an inter-oceanic post route. NWA argues that Pan American is now seeking to change an entire Pacific route structure through an unreviewed extension of the Presidential directive which gave PAA the Seattle-Portland to Hawaii route.

Executive Competition—Chief-Mexico NWA claims it cannot under efficient service on its Pacific Northwest-Honolulu route because of Pan American's competition. Northwest is operating three flights weekly and PAA has flights weekly over the link.

"PAA's experience has so distorted traffic as to be a unique handicap in our ability to increase flight schedules to achieve greater efficiency and economy," Northwest told CAA. "It shows even at this early date that the traffic available and to be developed over this route is not clearly recognized by all, it is only adequate to support one carrier."

Northwest asked CAA to eliminate Seattle and Portland from Pan American's Pacific certificate. This NWA demand, will not result in carrier entry to PAA and actually will serve only to reduce the route to one carrier. One Northwest through destination of its Pacific Northwest-Honolulu route.



A man, followed by a thrusting weed burner equipped with a hose, is seen from the rear, burning a patch of grass on the runway. The 2100-degree burner

from the west burns under heat the weeds and the burning glaze creates for plane landing and takeoff.

Weed Burner "Sands" Runway Ice

Device lessens "no-traction" hazard by melting ice which has been pre-processed with a layer of sand.

A weed burner has been used successfully to overcome the hazards of runway ice at the Twin Cities' Wold-Chamberlain Field.

Send several acres of runway to be burned by conventional means often fails to become embedded in the ice and usually a Mow or a short time by propeller blast. Packed sand has been used but has not proved entirely satisfactory because too much heat is lost in the spreading operation.

Faced by as much as two inches of glazed ice on Wold-Chamberlain Field recently, Airport Manager L. D. Howard and Assistant Manager Roy A. Johnson decided to try a new method, and results were gratifying.

Good Traction Provided—Sand was incorporated into the ice with a thrusting weed burner. In two hours the 6000 ft. north-south runway provided safe landing and taxi conditions, according to pilots.

The machine used in the test was a Wolden Model PB-1 weed burner manufactured by the Wolden Machine Co., Minneapolis. It is a five-horsepower unit that covers an area 15 ft. wide. It burns either No. 1, 2, or 3 fuel oil at the rate of 50 gal. an hour. The machine was equipped with burner about 15 in. above the runway, and the temperature of the flame was 2100 degrees F.

"Two methods of operation were tried," according to Johnson. "The first was to run the burner over the surface and then spread sand on the wet ice and let it freeze. The second method was to spread the sand first and follow with the burner, which literally fused the sand into the ice."

Best Method Found—Johnson said on the second process the most satisfactory since the sand itself, while in

place, is heated to a high temperature so that a better impregnation results.

The second method also proved better at Wold-Chamberlain because the sand spreader used provided all a much faster spread and could be kept well ahead of the burner. It is not necessary to integrate the burner and sand spreader operations closely when the burner follows the spreader.

The burner weighed 600 pounds when spread at about three or four miles an hour. At that speed, sufficient heat was applied to the ice to create a thin film of water which then froze again with the sand in a matter of minutes.

Cost of Operation—The burner was pulled by a field tractor, with one man on the burner and another on the tractor. The M110 weed burner costs about \$25 a hour to operate with the fuel in the spreading truck. The 25 tons of sand put on the 6000 ft. runway, 50 ft. wide, cost about \$30.

Sand removed in place will be set on the runway displaced through snow and compaction. Johnson believes the best applied to the surface of the glaze had some effect in saving it to break up sooner.

Flying Boat Sale

World Airways, Inc., New York, plans to sell its fleet of seven Boeing T14 flying boats plus miscellaneous equipment. Price reportedly is around \$199,000. The airplane series, which was active on the New York-Baltimore-Portland route last year, used one of its seven four-engine, 40-foot ships to handle up to 60 passengers per flight. Pan American Airways and BOAC originally operated the flying boats.



NWA's CONVERTIBLE DC-4

Novara-based operator on the Seattle-Wold-Chamberlain route on agreed some still are in competition with Northwest Airlines and CAA's combination cargo and passenger DC-4 last month. The plane, converted by Pacific Ocean Airlines, Ontario, Calif., is fitted with 16 standard seats and 25 fold-down seats. Each pair of folding seats adding about the mid-size of passenger seating when not in use. This from the forward part

of the plane for cargo. Conversion of each pair of seats is accomplished without loss of a matter of seconds. When the seats are folded, these seats immediately provide for cargo position in cargo bins. The 20 standard seats, which also can be removed, are separated from the cargo section by a bulkhead. Under the metal bulkhead of these flights, seats between Seattle and San Jose, 14,000 ft. cargo bins were erected.

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"Go-Show" Fare Cut Asked by Northeast

Northeast Airlines has asked CAB permission to sell temporary seats at one-third reduction from the regular one-way fare between consecutive stops on its system. The association would make it possible for "go-show" passengers to travel by air at greatly reduced transportation rates.

Under the plan presented for CAB approval, approved Portland-Augusta, N.H., fare would be only \$1.68 compared to \$3.90 for reserved seats, Boston Concord, Mass., \$3.96 compared to \$4.60, and New Bedford Martha's Vineyard, Mass., \$4.66 compared to \$6.10.

Unreserved tickets would be sold from the passenger's point of origin to the next scheduled stop of the flight on which he is traveling. The unreserved seats would be allocated at airport sales counters on a first-come, first-served basis.

Financial Aid to PIA

Government of Peru has announced that it will extend financial support to Peruvian International Airways, which it describes as "the only non-scheduled international scheduled air carrier in the world."

Details of the financial assistance have not yet been settled but are being worked out between government of Peru and PIA representatives. Extension of Peruvian government support will, according to PIA, partially offset the heavy U. S. government subsidies which have been enjoyed by our two principal competitors—Panagra and BOAC.

Tariff Extended

Capital Airlines' aircraft trail for the New York Pittsburgh-Chicago route has been extended to July 31.

Past 90 days not too hot for "Nighthawk" flights, which began Nov. 4, found Capital's approach local business strategy for above the 90 percent local, extra point. Added by holiday traffic load factors seemed to be average of 77 percent in December. In January, we only one of the worst months of the year for Capital, average load factor for Nighthawk type was 75 percent, a mark which exceeded company expectations.

Pay Hike at AA

American Airlines has notified its agreement with the Transport Workers Union (TCU) providing for an 8 cent an hour wage hike for maintenance and sixty personnel throughout the U. S. The union had threatened to strike for

a 16 cent an hour increase after originally demanding 25 cents (Associated Press, Jan. 31). The new agreement affects 4500 workers and is retroactive to the first of the year. Union officials said the hourly rate for AA employees concerned now averages \$1.72 and is the highest in the airline industry for such workers.

Southern Aircraft Declared Bankrupt

Southern Aircraft Co., Garland, Tex., which during the war produced an estimated \$55 million in parts for bombers and fighters, has been declared bankrupt. Company had turned to government for assistance of gas turbines and school bus bodies, and in April, 1949, had signed a contract to subcontract on its large plant on a 25-acre tract to a Texas manufacturer.

A meeting of creditors was set by a referee in bankruptcy for Feb. 15 at Dallas. A trustee then will be elected to conduct a sale of assets of Southern Aircraft at auction. Sale will take place Feb. 18.

Southern Aircraft began operations in March, 1945, and produced gas turbines, tank bay doors, bus, stabilizers, wing sections and engine and auxiliary flight controls. It had a peak employment of 1200 persons.

Skycoach to S. A.

The American Airlines plans to extend its New York-Puerto Rico coach service down the east coast of South America Mar. 1.

The move will result in 20 percent fare reductions in all ports served by PAA between New York and Buenos Aires. Fifty-five passenger DC-4s will be used for the coach service. No hot meals will be served. Coffee, fruit juice and soft will be provided in the morning and tea, lunch with coffee and soup will be available at other meal times.

First-class passengers on the New York-Buenos Aires run by 30 passenger DC-4s equipped with sleepers will fly air coach fare from New York to Buenos Aires will be \$495 one way, compared with a new first-class rate of \$560.

New Fare Pacts

Though fast from all points in United Air Lines coast-to-coast system to major cities around the world agreed with KLM Royal Dutch Airlines and Pan American Air Lines will become effective this month, subject to approval of the Civil Aeronautics Board.

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STRICTLY PERSONAL

IT'S GOOD FOR NAUSEA—We're not going to get into arguments about it but the conductive of this column has just been placed on the waiting list to receive all the correspondence for *Tip-Top*, "a polished chewing gum for nervous nausea." Mr. J. Sidney Wolf is the P.O. and his multipaged letter starts out "Dear Colman" . . . He contains a list of names of "Tip-Top" men, which we will keep on our desk, very handy at all times. Mr. Wolf has an answer for everything. It's *Tip-Top*. His letter even suggests that you carry a handy pocket with you and hand it out to everyone who can't stand expansion of the belly-servers. "O, that's nauting!"

JUST WORKING HER WAY —Larry E. Kirk, Chicago & Southern's supervisor of public relations, is just back from South America.

"At one aspect I was appalled by a very interesting young lady, fashionably dressed, and capable of making Spanish at mile-a-minute speed. With my best public relations foot well out, panicked by my neck, I bowed and said, 'Buenos dias.' At every indication of a Spanish oil company. This surprised her. The customer desk, at which I was asked for 10 business, at about 50:75, I suggested it was on my desk again and dutifully shifted out.

"I now find I am the proud possessor of one year's subscription to *Canoe*, a leading newspaper. All in Spanish. I can't read Spanish."

AN AIRLINE OF PILOTS—Can any other airline boast in many pilots among its executive force in Chicago & Southern's? Larry E. Kirk, public relations supervisor, emphasizes that Charles Peterson, head chairman, owns and flies his own Bonanza and has an astronaut pilot as well. Sidney A. Stewart, president, is a pilot with a record all the way back to World War I. James H. Cooper, a 2-man crew, at a licensed pilot, owning and flying his own Stearman Vindicator, and Kirk himself has held a certificate since 1935, and has about 7000 hours to his credit.

BRIGHT SAYINGS BY SHIRAZ—We didn't know this column had no less a writer as all tell the other day one of our favorite lady, publishing associates learned out that *Bruce Wilson Shindler's* contributions here embodied her. We had thought this was strictly a man's department, the *Esquire*, so that occasional piece is very deep. While we are prancing here in a hi's list "On a recent trip on a Friday Plus Day, the passengers left their shoes within our grasp—thought they were on a regular one of yesterday. On my DC-6 there are two stewardesses and it is the custom for one to take care of the passenger's baggage in the rear of the plane while the other looks after those toward the front."

"One of the stewardesses handed a little boy a drink of milk. 'Isn't the stewardess on duty?' his mother asked him, while the stewardess pulled up some of the pages from the book."

In his piping voice he answered, "I like the stewardess behind!"

STORIES ABOUT LITTLE OLD LADIES—Two stories about little old ladies. Roger Fleming, Alton's public relations director, says the one he heard about asked the stewardess how much speed they were making. After giving the answer, the stewardess added, "If we had a tail and we would be going even faster." To the little old lady said, "Gawd, you don't see have their tails on all of your planes, then?"

And Jack Kemp, public relations chief of progressive Pioneer Air Lines, told the one about the P.A. pilot who was in the habit of leaving the cockpit after the plane was on course and got greeted by an elderly, nervous lady who pointed a bone finger at him and demanded, "Young man, you got back up in that cockpit now!"

WHO CAN ANSWER THIS ONE?—Bessie Haddock of Alton's P. Agent & Associates on Los Angeles side of any reader of this column can tell us whether a certain story is true about one of Western's older pilots, a Kelly.

"I have been told many times that the old pilot once made a forced landing somewhere in the mountains way back when. He pulled out to a runway to be made for a takeoff. He took a wrong turn. Wandering off slightly he found no engine, saw no airport, and only mountains outside, so he bailed out, landing a bone. If true, it might make good reading." (We think it already has.)

WHAT'S NEW

New Books

"Trade-Marks," by H. Bennett, technical director, Glens Products Co., Inc., outlining principles of trademark as letters, listings of trademarks and legal aspects. Published by Glens Products Co., Inc., 22 Court St., Brooklyn 2, N. Y. 510 pages, \$10.

"Bibliography on X-Ray Stress Analysis," with subject index, by Herbert B. Dinnberger. Published by St. John's X-Ray Laboratory, California, N. J. 140 references, price \$1.

"Rocket Propulsion Elements," by George P. Schrier, supervisor of rocket development, North American Aviation, Inc. Published by John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y.

New Films

"The Story of Airflight," depicting progress of recent developments in air shipping, available through sponsorship of Shick Airways, Inc., San Antonio, Tex.

"Human Factors in Safety," set in a series, released by the National Safety Council to aid management's human training program. Further information available from National Safety Council, 33 North Wacker Drive, Chicago 6, Ill.

Trade Literature

"Metal News," volume 4, number 14, directory has containing news stories by including new roles. Available from Metallurgy Engineering Co., 1514 W. St., Long Island City 1, N. Y.

"Painted Solignum Resin," a booklet designed to aid users of materials in select, buy and use these properly available upon request to Federal Metallurgical Corp., North Chicago, Ill.

"Catalog No. 46-A," pocket size catalog in Cath fluorescent and standard vent lighting equipment, available upon request to The Edwin F. Gath Co., 3517 Washington Ave., St. Louis 1, Mo.

"Trade Specifications," containing table of physical properties of Vitreous vitreous ethylene ester plastics, in the extreme formulas and flows. Available upon request to Tennessee Extrusion Corp., 10 East 40 St., N. Y. 16, N. Y.

"Remington-Union Air Work," a four-page folder available from Remington-Union, 4915 West 57 St., Chicago 38, Ill.

"Reflector RT-48," describing complete list of improved Dair-Rex, are three kinds of reflectors, available upon request to Colonial Reflect Co., Box 51, Harper Station, Detroit 15, Mich.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK, FEBRUARY 14, 1949

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PORTRAIT OF A P.A.

It is obvious that the P.A. we are talking about is not worrying about his job problems . . . he has turned them over to IOW. We recommend that you investigate the specialized services of the Indiana Gas Works.



Left: As a broad grey tank plant in operation. Top: As a broad grey tank plant in operation. Bottom: As a broad grey tank plant in operation.



the inside story of a **MIGHTY ENGINE**

Here's the engine that enables airliners to span continents and seas, making lands on the far side of the globe your nearby markets.

Here's the engine that powered the giant B-36 in its non-stop flight from Fort Worth, Texas, to Hawaii and back—a matter of 8,200 miles in 36 hours.

The Pratt & Whitney Wasp Major is a miracle of modern engineering. Packed in a space you can easily span with your arms is the power of 3,500 horses. So compact, so efficient is this mighty engine that it actually weighs less than one pound per horsepower.

Foote Bros. "A-Q" (aircraft quality) Gears play an important part in the amazing performance of the Wasp Major. These gears must carry heavy loads, must operate at pitch line velocities that can be measured in miles per minute, and yet the demands of compactness and light weight require extremely light sections. All this means accuracy that approaches laboratory perfection.

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